AMENDMENTS TO THE CLAIMS

1. (Canceled).

2. (Currently Amended) ~~The on-line grinding method for a work roll according to claim 1~~ An on-line grinding method for a work roll, adapted to press a rotating grinding wheel having elasticity against a work roll of a rolling mill to grind the work roll, characterized in that when a pressing load of the rotating grinding wheel reaches a set load F, which has been set beforehand at a value which is lower than a set grinding pressing load F_0, after the rotating grinding wheel contacts the work roll,

a forward velocity of the rotating grinding wheel is reduced to decrease an overshoot by which the pressing load of the rotating grinding wheel on the work roll exceeds the set grinding pressing load F_0,

characterized in that the load F which has been set beforehand has a value in a range satisfying the following equation (A):

$$F \leq F_0 - K \times V1 \times \Delta t \quad \ldots (A)$$

where

F: set load [N],

F_0: set grinding pressing load [N],

K: grinding wheel spring rigidity [N/mm],

V1: forward velocity [mm/s] of grinding wheel before velocity reduction, and

Δt: control delay time [s].

3. (Currently Amended) ~~The on-line grinding method for a work roll according to claim 1~~ An on-line grinding method for a work roll, adapted to press a rotating grinding wheel having elasticity against a work roll of a rolling mill to grind the work roll, characterized in that when a pressing load of the rotating grinding wheel reaches a set load F, which has been set beforehand at a value which is lower than a set grinding pressing load F_0, after the rotating grinding wheel contacts the work roll,

a forward velocity of the rotating grinding wheel is reduced to decrease an overshoot by which the pressing load of the rotating grinding wheel on the work roll exceeds the set grinding pressing load F_0,

characterized in that a forward velocity V2 of the rotating grinding wheel after velocity reduction satisfies the following equation (B):

$$0.6\times(S\times F_0/(K\times\Delta t))\leq V2\leq S\times F_0/(K\times\Delta t) \ldots (B)$$

where

V2: forward velocity [mm/s] of rotating grinding wheel after velocity reduction,

S: ratio of allowable overshoot amount to set grinding pressing load F_0,

K: grinding wheel spring rigidity [N/mm], and

Δt: control delay time [s].

4. (Currently Amended) ~~The on-line grinding method for a work roll according to claim 2~~ An on-line grinding method for a work roll, adapted to press a rotating grinding wheel having elasticity against a work roll of a rolling mill to grind the work roll, characterized in that when a pressing load of the rotating grinding wheel reaches a set load F, which has been set beforehand at a value which is lower than a set grinding pressing load F_0, after the rotating grinding wheel contacts the work roll,

a forward velocity of the rotating grinding wheel is reduced to decrease an overshoot by which the pressing load of the rotating grinding wheel on the work roll exceeds the set grinding pressing load F_0,

characterized in that the load F which has been set beforehand has a value in a range satisfying the following equation (A):

$$F\leq F_0-K\times V1\times\Delta t \ldots (A)$$

where

F: set load [N],

F_0: set grinding pressing load [N],

K: grinding wheel spring rigidity [N/mm],

V1: forward velocity [mm/s] of grinding wheel before velocity reduction, and

Δt: control delay time [s],

characterized in that a forward velocity V2 of the rotating grinding wheel after velocity reduction satisfies the following equation (B):

$$0.6\times(S\times F_0/(K\times\Delta t))\leq V2\leq S\times F_0/(K\times\Delta t) \quad \text{... (B)}$$

where

V2: forward velocity [mm/s] of rotating grinding wheel after velocity reduction,

S: ratio of allowable overshoot amount to set grinding pressing load F_0,

K: grinding wheel spring rigidity [N/mm], and

Δt: control delay time [s].